

(PCT Article 36 and Rule 70)

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/014066

Box No. I

Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-9 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- nos. _____ as originally filed/furnished
- nos.* _____ as amended (together with any statement) under Article 19
- nos.* 1-6 _____ received by this Authority on 02.03.2006 with letter of 02.03.2006
- nos.* _____ received by this Authority on _____
- ☐ the drawings:
- sheets _____ as originally filed/furnished
- sheets* _____ received by this Authority on _____
- sheets* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>5</u>	YES
	Claims	<u>1-4, 6</u>	NO
Inventive step (IS)	Claims	<u>5</u>	YES
	Claims	<u>1-4, 6</u>	NO
Industrial applicability (IA)	Claims	<u>1-6</u>	YES
	Claims	<u></u>	NO

2. Citations and explanations (Rule 70.7)

See supplemental sheet.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: I and VI

1 Reference is made to the following documents:

- D1: WO 00/43442 A (SUNPOR KUNSTSTOFF GMBH) 27
July 2000
- D2: EP-A-0 425 973 (BASF AKTIENGESELLSCHAFT) 8
May 1991
- D3: EP-A-0 682 077 (BASF AKTIENGESELLSCHAFT) 15
November 1995
- D4: US 2003/162852 A1 (CHAUDHARY BHARAT I ET AL.)
28 August 2003

2 D1 (claim 1; example 1; page 3, lines 30-32; page 5, lines 18-22) describes a method of producing expandable polymer granules, said method comprising the following steps:

- a) providing a styrene polymer,
- b) mixing pentane into the polymer melt,
- c) cooling the melt to about 120°C,
- d) extruding through a hole type nozzle having a diameter of about 0.8 mm,
- e) underwater pelletizing of the blowing agent-containing melt at increased pressure,
- f) prefoaming the obtained expandable particles to 15 g/l, and
- g) fusing the expanded particles to produce slabstock foam.

D1 does not describe mixtures of styrene polymers as described in the present claims 1, 3 and 5.

Supplemental Box

The subject matter of main claims 1, 3, 5 and 6 is therefore novel over D1 (PCT Article 33(2)).

- 3 D2 (claims; examples; page 3, lines 39-44) describes a method of producing expandable polymer granules in which styrene is polymerized in the presence of a non-crosslinked styrene-diene copolymer. It is anticipated by claim 1 of D2 that such a method would produce a mixture of 10-90% by weight pure (radically polymerized) polystyrene and 10-90% by weight crosslinked styrene-diene copolymer.

Furthermore, D2 describes a method of producing expanded polystyrene foams in which the granules are prefoamed to about 20 g/l by heating and subsequently fused.

The subject matter of main claims 1, 3 and 6 is therefore not novel over D2 (PCT Article 33(2)).

A method according to the present claim 5 is not anticipated by D2.

- 4 D3 (claims 1, 9, 10) describes expandable thermoplastic polymer granules comprising *inter alia* a) 5-20% by weight of a styrene block copolymer and b) 50-90% by weight of a radically polymerized polystyrene.

Furthermore, D3 (claim 13; examples) describes a

Supplemental Box

method of producing expanded polystyrene foams in which the granules are prefoamed to 23.8 g/l by heating and subsequently fused in a steamable press.

The subject matter of main claims 1, 3 and 6 is therefore not novel over D3 (PCT Article 33(2)).

A method according to the present claim 5 is not anticipated by D3.

- 5 D4 (claims 1, 2; paragraphs [0074], [0075], [0089], [0105], [0106]) describes expandable thermoplastic polymer granules comprising a) 20-85% by weight of a styrene copolymer or homopolymer and 15-80% by weight of a copolymer which can comprise vinylaromatic, vinyl and/or vinylidene units.

D4 does not disclose styrene copolymers as described in the present main claims.

The subject matter of main claims 1, 3, 5 and 6 is therefore novel over D4.

- 6 D1 is considered to be the prior art closest to method claim 5.

D1 describes a method from which the subject matter of claim 5 differs at least by the composition of the styrene polymer.

Supplemental Box

Since it is unclear what technical effect is brought about by this distinguishing feature, the objective problem addressed by the present application can be regarded as that of providing another method.

D2 and D3 do not describe a melt extrusion process and therefore cannot be used in the assessment of inventive step. The subject matter of the present claim 5 therefore cannot be derived in an obvious way from the combined prior art and, for this reason, meets the requirements of PCT Article 33(3).

- 7 Dependent claims 2 and 4 do not contain any features which, in combination with the features of any claim to which they refer back, meet the PCT requirements for novelty and inventive step.